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Religiosity, Alcohol Use Attitudes, and Alcohol Use in a National Sample of Adolescents

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### Abstract

The purpose of this study was to investigate alcohol use attitudes as a mediator of the relationship between religiosity and the frequency of past month alcohol use in a national sample of adolescents. Data were drawn from 18,314 adolescents who participated in the 2006 and 2007 National Survey on Drug Use and Health. Variables included religiosity, alcohol use attitudes, and past month frequency of alcohol use. Structural equation modeling was used to test alcohol use attitudes as a mediator of the relationship between religiosity and frequency of alcohol use and to test model invariance across 4 racial/ethnic groups. Results suggest that alcohol use attitudes partially mediate the relationship between religiosity and frequency of alcohol use. Furthermore, while the pattern of these relationships is similar across racial/ethnic groups, the magnitude of alcohol use attitudes on frequency of alcohol use differed. Implications for prevention programs include targeting alcohol use attitudes in a variety of settings.

*Key Words:* Religiosity, Attitudes about Alcohol Use, Alcohol, Racial/Ethnic Differences

### Religiosity, Alcohol Use Attitudes, and Alcohol Use in a National Sample of Adolescents

The Monitoring the Future study documents important racial/ethnic differences in alcohol use among White, African American and Hispanic youth (Johnston, O'Malley, Bachman, & Schulenberg, 2009). In 8<sup>th</sup> grade, 21.5% of Hispanic adolescents report past month alcohol use followed by 15.2% of White and 12.9% of African American youth. By 12<sup>th</sup> grade these rates rise to 60% for White youth, 51.5% for Hispanic youth and 33.7% for African American youth. Given the variation in alcohol use among these groups, prevention research aims to study salient risk and protective factors in a variety of developmental and cultural contexts (e.g. Prado, Szapocznik, Maldonado-Molina, Schwartz, & Pantin, 2008).

Bronfenbrenner's (1979) ecology of human development posits that development occurs in the context of interrelated systems. The primary contexts in which adolescents develop are *microsystems* (e.g., family, religion) and the interactions between the microsystems are considered *macrosystems* (e.g., parental involvement with church). Religion operates at both the microsystemic and macrosystemic levels. Thus, adolescents' development is influenced not only by involvement in religion, but also by the cultural context within which religion is embedded. The complex interrelationships between contexts may yield differential alcohol use outcomes.

Research on religious importance and involvement, broadly labeled *religiosity*, indicates that African American adolescents are more likely to be religious than their White peers (Brown, Parks, Zimmerman, & Phillips, 2001; Wallace, Brown, Bachman, & Laviest, 2003). One reason for this may be that religion represents a salient aspect of African American culture (Hines & Boyd-Franklin, 2005). Religiosity has also been found to protect against substance use (Marsiglia et al., 2005; Walker, Ainette, Wills, & Mendoza, 2007; Wallace et al., 2003). Park and colleagues (2001) found that participation in religious activities predicted less alcohol use

for Hispanic students, while perceiving oneself as religious predicted less alcohol use for other racial/ethnic groups. Still, less is known about the mechanisms by which religiosity may impact alcohol use and whether these mechanisms operate similarly across groups.

Religiosity may impact alcohol use through the development of negative attitudes about alcohol use (Johnson, Sheets, & Kristeller, 2008). Studies have found that higher levels of disapproval predict lower levels of substance use (Bachman, Johnston, & O'Malley, 1998; Kumar, O'Malley, Johnston, Schulenberg, & O'Malley, 2002). Though Stern and Weins (2009) found no differences between White and African American youth in alcohol use attitudes, they did not test racial/ethnic differences in the relationships between attitudes and alcohol use. Variation in cultural and developmental contexts may yield differential relationships between attitudes and alcohol use outcomes.

Few studies have investigated whether such alcohol use attitudes mediate the relationship between religiosity and alcohol use. Among college students, more religious individuals endorse greater disapproval of alcohol use and subsequently report lower levels of use (Chawla et al., 2007). While Chawla and colleagues' sample was quite diverse, they did not test racial/ethnic differences in their analyses. Among adolescents, Walker and colleagues (2007) found that religiosity impacted self-control and tolerance for deviance which, in turn, impacted alcohol use attitudes and finally impacted substance use. Though these authors tested racial/ethnic differences in their structural models, they did not specifically test the indirect relationship of religiosity and alcohol use via attitudes or test race/ethnicity as a moderator of this relationship.

Religion represents an important developmental context for adolescents and may influence the adoption of negative alcohol use attitudes, thus protecting them from excessive alcohol use. The aim of this study is to build upon the work of Chawla and colleagues (2007) by

(a) testing alcohol use attitudes as a mediator of the relationship between religiosity and alcohol use in a national sample of adolescents and (b) testing race/ethnicity as a moderator of this relationship. We hypothesize that religiosity will be related to more disapproval of alcohol use and, thus, related to less frequent drinking. We also hypothesize that race/ethnicity will moderate this relationship with a stronger mediating effect for African Americans due to the greater cultural emphasis on religiosity (Hines & Boyd-Franklin, 2005).

## **Methods**

### **Participants**

Secondary data analysis of publicly available data from the 2006 and 2007 National Survey on Drug Use and Health (NSDUH) was conducted for this study (U.S Department of Health and Human Services, 2009a, 2009b). Participants were adolescents aged 12 to 17 who reported lifetime alcohol use. Due to the small sample sizes for Native American and Asian/Asian American adolescents, only data from White, African American, Hispanic, and Multiracial adolescents were used, yielding an initial sample of 14,297. The sample demographics are summarized in Table 1. For the current study, 63.8% of the sample identified as White, 12.8% identified as African American, 18.1% identified as Hispanic, and 1.6% identified as Multiracial. Fifty-one percent of the sample was male and the average age was 15.39 years old (S.E. = .02).

### **Materials and Procedure**

The NSDUH, conducted by the U.S. Federal Government, is designed to estimate the prevalence of drug use in the United States (Caviness, et al., 2007). Participants completed computer-assisted interviews regarding drug use and related correlates. For a complete description of the study procedures including sampling method, see Caviness and colleagues

(2007). Approval, with exempt status, was received from Indiana University's Institutional Review Board for this secondary data analysis.

**Demographics.** The NSDUH dataset provides a recoded variable for Race and Ethnicity with 7 groups. Participants were asked whether they are of "Hispanic, Latino or Spanish" origin, followed by questions regarding membership in 7 other racial/ethnic groups (e.g. Black/African American). Four of these racial/ethnic groups were used for the current study: White (non-Hispanic), African-American, Hispanic, and Multiracial. Gender was dummy coded (female = 0; male = 1). Family income was coded as "less than \$20,000", "\$20,000-\$49,999", "\$50,000 – \$74, 999". Grades in school were coded as "D's or failing", "C's", "B's" and "A's".

**Religiosity.** Religiosity was a latent construct consisting of three items on a 4-point likert scale (strongly agree, agree, disagree and strongly disagree): "*My religious beliefs are very important,*" "*My religious beliefs influence my decisions,*" and "*It is important that my friends share my religious beliefs*".

**Alcohol Use Attitudes.** A three item latent variable was used to measure alcohol use attitudes. Using a 3-point likert scale (strongly disapprove, somewhat disapprove, and neither approve nor disapprove), participants rated their level of approval of hypothetical alcohol use by peers who are their same age as well as the participants' perceptions of approval of their own use by "close friends" and by a parent.

**Alcohol Use.** A single item reflecting the number of days of alcohol use in the past month was used to measure alcohol use.

### **Data Management and Data Analytic Plan**

Data for all variables in the model were assessed for missing values, skewness, and kurtosis. For each variable of interest, less than 5% of the cases had missing values. The

frequency of past month alcohol use was skewed, likely due to the high rate of non-use in the sample. This variable was log transformed, yielding an acceptable level of skew (value  $\leq 2$ ).

To utilize NSDUH's sampling weights, descriptives and correlations were analyzed utilizing the complex samples module for SPSS. Structural Equation Modeling (SEM) was used to build upon Chawla and colleagues' (2007) mediation model in an adolescent sample. Again, in order to include the sampling weights, Mplus (Muthen & Muthen, 2010) was used to conduct SEM analyses and bootstrapping was used to test for indirect effects. Model fit was assessed using the Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA). Values of greater than .95 for the CFI and less than .06 for the RMSEA are indicative of good model fit (Schrieber, Stage, King, Nora, & Barlow, 2006). Although we report results from the chi square test, it was not used to assess model fit, as chi square can be misleading in analyses with large sample sizes (Kline, 2005). Multigroup analysis tests a series of models to determine model invariance by race/ethnicity. First, an unconstrained model that allows the groups to differ was estimated. Next, we tested a model constraining the measurement weights, followed by a model constraining the structural weights and, finally, a fully constrained model. Chi square differences were used to test for a decrement in model fit. A decrement in model fit suggests there are group differences and that the model where the estimates are allowed to differ fits the data best. Mediation was tested using the bootstrapping procedure in Mplus, which yields an estimate and p value for the indirect effect (Hayes, 2009).

## **Results**

### **Descriptives**

Table 1 presents descriptive statistics for religiosity, alcohol use attitudes, and alcohol use variables. Notably, in the past month, White adolescents drank on average two days, Hispanic

and Multiracial adolescents drank approximately one and a half days, and African American adolescents drank only one day. The percentage of adolescents reporting no past month alcohol use ranged from a high of 70.7% for African Americans to a low of 56.4% for Whites.

### **Measurement and Overall Model**

Our proposed model includes two latent variables measuring religiosity and alcohol use attitudes. The measurement models fit the data well,  $\chi^2 = 23.49$ ,  $p < .001$ ; CFI = .99; RMSEA = .01 (90% C.I. .007-.019). In the first overall model, alcohol use attitudes were tested as a mediator of the relationship between religiosity and alcohol use (see Figure 1). Income, gender, and grades in school were included as predictors of religiosity, alcohol use attitudes, and alcohol use (see Table 2 for correlations). Results provided good model fit  $\chi^2 = 341.71$ ,  $p < .001$ ; CFI = .98; RMSEA = .03 (90% C.I. .031-.037). More religiosity was related to fewer drinking days in the past month,  $b = -.04$ ;  $p < .001$ . More religiosity was also related to greater disapproval of daily drinking,  $b = .05$ ;  $p < .001$ . Finally, greater disapproval of daily alcohol use was related to fewer drinking days,  $b = -.55$ ;  $p < .001$ . The indirect effect of religiosity via alcohol use attitudes was  $-.03$ ,  $p < .001$ . Girls ( $b = -.04$ ), those with better grades ( $b = .08$ ), and those with lower levels of income ( $b = -.05$ ) reported higher levels of religiosity. Gender and grades in school were significant covariates for alcohol use attitudes such that girls ( $b = -.04$ ) and those with better grades in school ( $b = .04$ ) had more disapproving alcohol use attitudes. Finally, girls ( $b = -.03$ ) and those with greater family income ( $b = .03$ ) reported more drinking days.

### **Multigroup Model**

Multigroup analyses tested the moderating effects of race and ethnicity on the relationships between religiosity, alcohol use attitudes, and alcohol use. Compared to the unconstrained model, the models constraining the measurement ( $\Delta\chi^2 = 43.45$  (13),  $p < .001$ ) and



structural ( $\Delta\chi^2 = 165.03$  (30),  $p < .001$ ) weights revealed decrements in model fit. Finally, the fully constrained model also showed a decrement in model fit, ( $\Delta\chi^2 = 230.24$  (49),  $p < .001$ ).

These results suggest that the unconstrained model fits the data better than the constrained models and that there are differences across racial/ethnic groups. Model fit for the unconstrained model was good,  $\chi^2 = 527.01$ ,  $p < .001$ ; CFI = .98; RMSEA = .04 (90% C.I .034-.04).

Table 3 presents the unstandardized and standardized coefficients for each path by racial/ethnic group. The paths between religiosity and alcohol use were significant for White ( $b = -.03$ ), Hispanic ( $b = -.05$ ), and Multiracial ( $b = -.04$ ) adolescents, but not for African American ( $b = -.002$ ) adolescents. The relationship between religiosity and alcohol use attitudes was significant for all groups with similar magnitudes, ranging from a high of  $b = .22$  for Hispanics to  $b = .15$  for African Americans. For all groups, more religiosity was related to more disapproving alcohol use attitudes. More disapproving attitudes were also related to fewer past month drinking days. For this path, there was wider variation in the magnitudes of these relations. Disapproving attitudes had a greater impact for White ( $b = -.12$ ) and Multiracial ( $b = -.15$ ) adolescents than for African American ( $b = -.07$ ) and Hispanic adolescents ( $b = -.07$ ). Bootstrapping revealed significant indirect effects for religiosity via alcohol use attitudes for all groups.

### Discussion

Research has consistently shown that more religiosity deters substance use (e.g., Marsiglia et al., 2005). The current study utilizes Bronfenbrenner's (1979) ecology of human development to conceptualize the interrelationships between religiosity, alcohol use attitudes, and alcohol use. That is, religion represents an important developmental context and the extent to which adolescents internalize the values of the context may impact alcohol use in both and indirect ways. Overall, our results suggest that more disapproval of alcohol use mediates, at least

in part, the relationship between religiosity and frequency of past month alcohol use. Thus, changing one's attitudes about alcohol use may be one mechanism by which religion protects against excessive alcohol use. These results are consistent with similar research findings that attitudes mediated the relation between religiosity and alcohol use among college students (Chawla, et al., 2007). However, this is the first known study that examines this relationship in a national sample of adolescents.

A second aim of the current study tested the hypothesis that race and ethnicity moderate this relationship. Results from the multigroup SEM supported this hypothesis. Greater religiosity was significantly related to fewer days of alcohol use for White, Multiracial, and Hispanic adolescents, but not for African American adolescents. This finding might reflect more overall religiosity among African Americans (Brown et al., 2001), such that religious involvement is a more universal developmental context for these adolescents even among those who use alcohol. For African Americans, the results also supported the hypothesized model in which alcohol use attitudes mediated the relationship between religiosity and alcohol use.

For all groups, religiosity was associated with more disapproval of alcohol use. Alcohol use attitudes also impacted the frequency of past month alcohol use among White and Multiracial adolescents, and to a lesser degree, among African American and Hispanic adolescents. The results of the present study are consistent with other research that highlights the salience of alcohol use attitudes on frequency of alcohol use (Bachman et al., 1998; Kumar et al., 2002) and provide evidence for differences among racial/ethnic groups in the relationship between alcohol use attitudes and frequency of alcohol use.

The results of the current study have implications for prevention research and practice. Alcohol use attitudes are a salient mechanism by which religiosity impacts alcohol use and

represent an important target for prevention. Religious and faith-based organizations may be one important venue for altering attitudes about alcohol use. Indeed, De Haan and Trageton (2001) found that 50% of their sample had received information on substance use from church. More research is needed to test whether alcohol use attitudes similarly mediate the relationship between other developmental and cultural contexts and alcohol use outcomes.

Important racial/ethnic differences emerged in the paths from alcohol use attitudes to frequency of alcohol use which may impact the tailoring of prevention interventions. Alcohol use attitudes had the greatest impact on alcohol use among White and Multiracial adolescents. Therefore prevention efforts targeting these groups might include components aimed at modifying pro-alcohol use attitudes. Prevention efforts for other racial/ethnic groups should target alcohol use attitudes, but should also include components reflecting other salient risk and protective factors for those groups.

The results of this study should be interpreted in light of its limitations and strengths. First, measurement of study constructs is limited to those items in the survey. Although there is wide variation in the measurement of religiosity and related constructs (Dew et al., 2008; Rew & Wong, 2006), religiosity was measured using only three items. One strength of the items in the current study is that adolescents rated the importance of religion in their life rather than frequency of attendance at religious activities which may, in part, be reflective of parental insistence on attendance rather than an internalized sense of religiosity. Adolescents also rated the role of religion in decision making and the desire to have peers with similar religious beliefs. This is an important distinction in an adolescent sample given that adolescents are still developing in terms of their identities, morals, and values. Likewise, disapproval of alcohol use was measured with three items. Frequency of alcohol was measured with a single item and

though this is common in substance use research, it is possible that use of both quantity and frequency items may yield different results. Future research on religiosity and alcohol use attitudes should utilize empirically validated measures for these constructs. Second, the current study tested mediation using cross-sectional data. Thus, although the results are consistent with the hypothesized mediation model, the direction of mediation effects among variables is unclear. Alternative mediating pathways, which could be supported by cross-sectional data, were not tested. Third, gender emerged as a predictor of religiosity, alcohol use attitudes, and alcohol use, but not uniformly across all racial/ethnic groups. A more in-depth analysis of gender differences was beyond the scope of this study, but represents an important area for future research. Finally, from an ecological perspective, there are other cultural variables not available in this dataset that represent important predictors of alcohol use including, but not limited to, acculturation and racial/ethnic identity. Despite these limitations, there are noteworthy strengths of the current study. The NSDUH is a nationally representative sample which increases the generalizability of results to adolescent populations who have initiated substance use. Moreover, the sample size allowed for testing whether these relationships differed across 4 racial/ethnic groups.

Results of the current study found alcohol use attitudes to be an important predictor of alcohol use which suggests that attitudes may be an important target of prevention and intervention in a number of settings including faith-based programs. Furthermore, prevention should aim to understand what cultural factors might also play a role in the development and internalization of negative alcohol use attitudes. Such interventions are critical to preventing not only initiation and escalation of use, but also the potential life-long physical and mental health problems associated with substance use disorders.

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Table 1. Descriptives by Racial and Ethnic Groups

Variable	White (n=9,329)	African- American (n=1,772)	Hispanic (n=2,603)	Multiracial (n=593)	Total Sample (n=14,297)
Age	15.42 (.02)	15.31 (.04)	15.32 (.02)	15.16 (.09)	15.38 (.02)
# Days Alcohol Use <sup>a</sup>	2.03 (.06)	1.00 (.08)	1.65 (.10)	1.56 (.20)	1.82 (.04)
% reporting not drinking in the past 30 days	56.4%	70.7%	61.2%	63%	59.2%
Parental attitudes about your drinking	2.77 (.01)	2.79 (.02)	2.76 (.02)	2.74 (.04)	2.77 (.01)
Your attitudes about peers' drinking	2.23 (.01)	2.36 (.03)	2.28 (.03)	2.12 (.06)	2.25 (.01)
Close friends' attitudes about your drinking	2.16 (.01)	2.28 (.03)	2.20 (.03)	2.13 (.06)	2.18 (.01)
My religious beliefs are very important	2.70 (.02)	3.11 (.03)	2.88 (.02)	2.69 (.07)	2.79 (.01)
My religious beliefs influence my decisions	2.50 (.01)	2.89 (.03)	2.64 (.02)	2.49 (.06)	2.57 (.01)
It is important that my friends share my religious beliefs	1.94 (.01)	2.32 (.03)	2.03 (.02)	1.93 (.06)	2.01 (.01)
a. pre-log transformation					